

REMARKS/ARGUMENTS

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 8-17 are pending in the present application, Claims 11 and 15 having been amended. Applicant respectfully submits that no new matter is added and that no new search is required. Accordingly, Applicant respectfully requests that the present amendment be entered.

In the outstanding Office Action, the specification was objected to; Claims 11 and 15 were objected to; and Claims 8-17 were rejected under 35 U.S.C. §103(a) as unpatentable over *Series Resonant Converter with Sandwich-Type Piezoelectric Ceramic Transducers*, 6<sup>th</sup> European Conference on Power Electronics and Applications, pages 591-594, by P. Fabijanski (hereinafter Fabijanski) in view of Rueger et al. (U.S. Patent No. 7,019,436), and further in view of Yamada et al. (U.S. Patent No. 5,036,263, hereinafter Yamada).

With respect to the objection to the specification, the specification is amended as suggested in the outstanding Office Action. Accordingly, Applicant respectfully requests that the objection to the specification be withdrawn.

With respect to the objection to Claim 11, Claim 11 is amended to depend from Claim 10. Accordingly, Applicant respectfully requests that the objection to Claim 11 be withdrawn.

With respect to the objection to Claim 15, Claim 15 is amended to recite “the bridge switch is configured to be activated in repeated first and second phases.” Accordingly, Applicant respectfully requests that the objection to Claim 15 be withdrawn.

With respect to the rejection of Claim 8 as obvious over Fabijanski, Rueger, and Yamada, Applicant respectfully traverses the rejection. Claim 8 recites, *inter alia*, “a current

flowing in the load is a periodic signal of a resonance frequency such that a chopping frequency of the signal is smaller than twice the resonance frequency.”

The outstanding Office Action concedes that Yamada does not discuss the chopping frequency relative to the resonance frequency. However, the outstanding Office Action takes the position that it would be obvious to select the chopping frequency that would result in the appropriate amount of charging.<sup>1</sup> In support of this position, the outstanding Office Action cites to col. 11, lines 10-15 of Yamada, which states “the amount of energy of electric charge supplied to the capacitor 3 may be controlled by...controlling the chopping frequency f.”

Assuming *arguendo* that the outstanding Office Action is correct that it is obvious to select a chopping frequency that would result in the appropriate amount of charging, there is still no teaching or suggestion that a chopping frequency that is smaller than twice the resonance frequency results in the appropriate amount of charging for the device disclosed in Yamada. A broad disclosure that the chopping frequency can be controlled does not disclose or suggest the claimed “chopping frequency of the signal is smaller than twice the resonance frequency.”

Furthermore, Applicants note that the specification discloses the following advantage when a chopping frequency of the signal is smaller than twice the resonance frequency. The specification states “[i]t makes it possible to limit the switching losses of the switches during their closing and to limit the effects of electromagnetic compatibility by current breaking.”<sup>2</sup>

If the outstanding Office Action intends to rely on design choice, that position is respectfully traversed. It is well established that when particular claimed feature is disclosed as solving particular problems and providing advantages, as in the present specification, the doctrine of design choice cannot be relied upon as a substitute for a clear and convincing

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<sup>1</sup> Office Action, page 5.

<sup>2</sup> Specification, page 8, lines 8-10.

showing of motivation that would logically have led the artisan to have made the proposed modification. See In re Chu, 36 USPQ2d 1089, 1094 (Fed. Cir. 1995).

Furthermore, Fabijanski and Rueger do not disclose or suggest the claimed “a chopping frequency of the signal is smaller than twice the resonance frequency.”

Thus, in view of the above-noted distinctions, Applicant respectfully submits that Claim 8 (and Claims 9, 14, and 15 dependent thereon) patentably distinguish over Fabijanski, Rueger, and Yamada, taken alone or in proper combination.

With respect to the rejection of Claim 10 as unpatentable over Fabijanski, Rueger, and Yamada, Applicant respectfully traverses this ground of rejection. Claim 10 recites, *inter alia*, “a current flowing in the load is a periodic signal whose phase is advanced relative to the voltage across the terminals of the load, and resonance frequency of the current is such that a chopping frequency of the signal lies between half and twice the resonance frequency.”

Again, the outstanding Office Action concedes that Yamada does not discuss the chopping frequency relative to the resonance frequency. However, the outstanding Office Action takes the position that it would be obvious to select the chopping frequency that would result in the appropriate amount of charging.<sup>3</sup> In support of this position, the outstanding Office Action cites to col. 11, lines 10-15 of Yamada, which states “the amount of energy of electric charge supplied to the capacitor 3 may be controlled by...controlling the chopping frequency  $f$ .”

Assuming *arguendo* that the outstanding Office Action is correct that it is obvious to select a chopping frequency that would result in the appropriate amount of charging, there is still no teaching or suggestion that selecting a chopping frequency that lies between half and twice the resonance frequency results in the appropriate amount of charging for the device disclosed in Yamada. A broad disclosure that the chopping frequency can be controlled does

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<sup>3</sup> Office Action, page 7.

not disclose or suggest the claimed “chopping frequency of the signal lies between half and twice the resonance frequency.”

Furthermore, Applicants note that the specification discloses the following advantage when a chopping frequency of the signal lies between half and twice the resonance frequency. The specification states “[i]t makes it possible to limit the switching losses of the switches during their opening and to limit the effects of electromagnetic compatibility by current breaking.”<sup>4</sup> Thus, the doctrine of design choice is inapplicable as discussed above.

Furthermore, the outstanding Office Action does not appear to consider the claim language “whose phase is advanced relative to the voltage across the terminals of the load.” It is well established that each word of every claim must be given weight. *See* MPEP § 2143.03 citing *In re Wilson*, 424 F.2d 1382, 1385, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970). Yamada does not disclose or suggest that the signal that charges capacitor 3 has a phase that is advanced relative to the voltage across the load.

Furthermore, Fabijanski and Rueger do not disclose or suggest the claimed “a current flowing in the load is a periodic signal whose phase is advanced relative to the voltage across the terminals of the load, and resonance frequency of the current is such that a chopping frequency of the signal lies between half and twice the resonance frequency.”

Thus, in view of the above-noted distinctions, Applicant respectfully submits that Claim 10 (and Claims 11 and 16 dependent thereon) patentably distinguish over Fabijanski, Rueger, and Yamada, taken alone or in proper combination.

With respect to the rejection of Claim 12 as unpatentable over Fabijanski, Rueger, and Yamada, Applicant respectfully traverses this ground of rejection. Claim 12 recites, *inter alia*, “a current flowing in the load is a periodic signal whose phase is retarded relative to the

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<sup>4</sup> Specification, page 9, line 38 to page 10, line 2.

voltage across the terminals of the load, and resonance frequency of the current is such that a chopping frequency of the signal is greater than half the resonance frequency.”

Again, the outstanding Office Action concedes that Yamada does not discuss the chopping frequency relative to the resonance frequency. However, the outstanding Office Action takes the position that it would be obvious to select the chopping frequency that would result in the appropriate amount of charging.<sup>5</sup> In support of this position, the outstanding Office Action cites to col. 11, lines 10-15 of Yamada, which states “the amount of energy of electric charge supplied to the capacitor 3 may be controlled by...controlling the chopping frequency f.”

Assuming *arguendo* that the outstanding Office Action is correct that it is obvious to select a chopping frequency that would result in the appropriate amount of charging, there is still no teaching or suggestion that selecting a chopping frequency that is greater than half the resonance frequency results in the appropriate amount of charging for the device disclosed in Yamada. A broad disclosure that the chopping frequency can be controlled does not disclose or suggest the claimed “chopping frequency of the signal is greater than half the resonance frequency.”

Furthermore, Applicants note that the specification discloses the following advantage when a chopping frequency of the signal lies between half and twice the resonance frequency. The specification states “[i]t makes it possible to limit the switching losses of the switches during their opening and to limit the effects of electromagnetic compatibility by voltage switching.”<sup>6</sup> Thus, the doctrine of design choice is inapplicable as discussed above.

Furthermore, the outstanding Office Action does not appear to consider the claim language “whose phase is retarded relative to the voltage across the terminals of the load.” It is well established that each word of every claim must be given weight. *See* MPEP § 2143.03

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<sup>5</sup> Office Action, page 9.

<sup>6</sup> Specification, page 11, lines 11-13.

citing In re Wilson, 424 F.2d 1382, 1385, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970). Yamada does not disclose or suggest that the signal that charges capacitor 3 has a phase that is retarded relative to the voltage across the load.

Furthermore, Fabijanski and Rueger do not disclose or suggest the claimed “a current flowing in the load is a periodic signal whose phase is retarded relative to the voltage across the terminals of the load, and resonance frequency of the current is such that a chopping frequency of the signal is greater than half the resonance frequency.”

Thus, in view of the above-noted distinctions, Applicant respectfully submits that Claim 12 (and Claims 13 and 17 dependent thereon) patentably distinguish over Fabijanski, Rueger, and Yamada, taken alone or in proper combination.

Moreover, Applicant respectfully submits that dependent Claims 14, 16, and 17 further patentably distinguish over Fabijanski, Rueger, and Yamada, taken alone or in proper combination. The outstanding Office Action concedes that Fabijanski does not discuss the specifics of the timing of opening and closing the switches of the apparatus of Fig. 6 of Fabijanski. The outstanding Office Action errs by curing deficiencies in the cited references with improper subjective conclusions, as explained below.

The subjective conclusion that Claims 14, 16, and 17 are obvious because the device of Fabijanski is capable of performing the timing sequence as described in Claims 14, 16, and 17 is clearly improper. It is not understood how this conclusion can be reached in light of the admission that “Fabijanski does not discuss the specifics of the timing of opening and closing the switches of the apparatus of Fig. 6.”<sup>7</sup> In this regard, it is noted that substitution of an improper subjective conclusion as to knowledge in the art for concrete evidence of such knowledge relative to a core factual finding required for a determination of patentability is clearly improper. See In re Zurko, 59 USPQ2d 1693, 1697-98 (Fed. Cir. 2001) as follows:

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<sup>7</sup> Office Action, pages 10, 11, and 12.

Finally, the deficiencies of the cited references cannot be remedied by the [PTO's] general conclusions about what is "basic knowledge" or "common sense" to one of ordinary skill in the art. As described above, the [PTO] contended that even if the cited UNIX and FILER2 references did not disclose a trusted path, "it is basic knowledge that communication in trusted environments is performed over trusted paths" and, moreover, verifying the trusted command in UNIX over a trusted path is "nothing more than good common sense." *Ex parte Zurko*, slip op. at 8. We cannot accept these findings by the [PTO]. This assessment of basic knowledge and common sense was not based on any evidence in the record and, therefore, lacks substantial evidence support. As an administrative tribunal, the [PTO] clearly has expertise in the subject matter over which it exercises jurisdiction. This expertise may provide sufficient support for conclusions as to peripheral issues. With respect to core factual findings in a determination of patentability, however, the [PTO] cannot simply reach conclusions based on its own understanding or experience — or on its assessment of what would be basic knowledge or common sense. Rather, the [PTO] must point to some concrete evidence in the record in support of these findings. [Emphasis added.]

The even more recent Lee decision by the Federal Circuit Court of Appeals (In re Lee, 61 USPQ2d, 1430, 1435 (2002)) is noted to emphasize the need for the PTO to provide actual evidence on the record, not mere unsupported opinion, as follows:

In finding the relevant facts, in assessing the significance of the prior art, and in making the ultimate determination of the issue of obviousness, the examiner and the Board are presumed to act from this viewpoint [that of the person of ordinary skill in the art to which the subject matter pertains]. Thus when they rely on what they assert to be general knowledge to negate patentability, that knowledge must be articulated and placed on the record. [Emphasis added.]

The Lee court further specifically found it to be erroneous and arbitrary conduct for the PTO to attempt to resolve questions material to patentability by reliance upon "subjective belief and unknown authority" (see In re Lee at 61 USPQ2d 1434) as is being done here.

Also note the Kotzab court admonition (at 55 USPQ2d 1317) that “[b]road conclusory statements are not evidence.”

Furthermore, the outstanding Office Action errs by not giving the functional limitations of Claims 14, 16, and 17 proper consideration. In this respect, the PTO has not instructed examiners to ignore functional claim definitions. To the contrary, and consistent with controlling precedent, MPEP §2173.05(g) instructs examiners that “[a] functional limitation must be evaluated and considered, just like any other limitation of the claim, for what it fairly conveys to a person of ordinary skill in the pertinent art in the context in which it is used” (emphasis added). In addition, note, for example, In re Angstadt, 190 USPQ 214, 217 (CCPA 1976) further requiring that functional limitations must properly considered.

Moreover, as establishing a **VALID** *prima facie* case of obviousness requires that there must be a showing that **ALL CLAIM LIMITATIONS** are taught or suggested, note MPEP §2143.03 and the decisions cited therein, for example, and as no such showing has been made, the obviousness rejection of Claims 14, 16, and 17 over Fabijanski, Rueger, and Yamada is clearly improper and should be withdrawn.

Furthermore, even if the outstanding Office Action is correct that the operation of an internal combustion engine (with fuel injectors) requires a very precise sequence of events to occur a correct times, this does not disclose or suggest the timing of events as recited in Claims 14, 16, and 17.

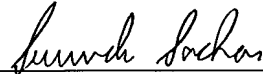
Accordingly, the PTO is called upon to present evidence that the timing sequence as recited in Claims 14, 16, and 17 are obvious to a person of ordinary skill in the art as required by MPEP §2144.03.



Consequently, in light of the above discussion and in view of the present amendment, the present application is believed to be in condition for allowance and an early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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